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— 国際調査報告書

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(54) Title: METHOD FOR MANUFACTURING SILICON CARBIDE BASED HONEYCOMB STRUCTURE AND SILICON CARBIDE BASED HONEYCOMB STRUCTURE

(54) 発明の名称: 炭化珪素質ハニカム構造体の製造方法及び炭化珪素質ハニカム構造体

(57) Abstract: A method for manufacturing a silicon carbide based honeycomb structure wherein a recycled raw material from a recovered material derived from a starting material for a silicon carbide based honeycomb structure, which has been generated in a process for manufacturing the silicon carbide based honeycomb structure, is used as a part of a starting material, which comprises using the above recycled raw material having been so pulverized as to have an average particle size of 10 to 300 μ m. The method allows the manufacture of a silicon carbide based honeycomb structure which is reduced in structure defects such as voids or coarse particles and has excellent strength and uniform heat conductivity, and further allows the shortening of the time required for kneading, since a material having been subjected to kneading is used as a part of a starting material.

(57) 要約: 炭化珪素質ハニカム構造体の製造過程で発生した当該ハニカム構造体の出発原料に由来する回収物から再生された再生原料を、出発原料の一部として用いたハニカム構造体の製造方法であって、前記再生原料が平均粒径 10 ~ 300 μ m に粉砕されている炭化珪素質ハニカム構造体の製造方法である。本発明によれば、炭化珪素質ハニカム構造体を製造する上で問題となっていたボイドや粗大粒子などの構造欠陥が形成されにくく、優れた強度や均一な熱伝導を有する炭化珪素質ハニカム構造体を得られる。また、既に一度混練が行われているものを出発原料の一部に使用しているため、混練時間を短縮することもできる。

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衝撃性が低下する傾向にある。

[0006] このため、DPFや排ガス浄化用触媒担体のように高い耐熱衝撃性が求められる製品に適用させようとする場合には、熱膨張係数の増大を抑える工夫が必要であり、例えば、特許文献1に記載された製造方法においては、再生原料のコーディエライト反応性比 R ($=$ プロエンスタイト/コーディエライト)が0.3以下となるようにすることで低熱膨張特性を有する製品が得られるようにしている。

[0007] また、特許文献2に記載された製造方法においては、未焼成の再生原料を粉砕して粉砕物を作製し、その粉砕物より直径1mm未満の粉砕物を除去し、残った粉砕物のみを使用して製品の製造を行うことにより熱膨張係数の増大を抑えている。更に、特許文献3に記載された製造方法においては、未焼成の再生原料中に含まれるバインダーの少なくとも一部を再生原料から取り除くことにより粉砕しやすくし、再生原料の粒子を変質させずに粉砕することで熱膨張係数の増大を抑えている。

特許文献1: 特公平3-72032号公報

特許文献2: 特開平8-119726号公報

特許文献3: 特開2000-302533号公報

発明の開示

[0008] 前記の従来技術は、何れもコーディエライト質のハニカム構造体に関するものであるが、最近ではDPFや触媒担体用のハニカム構造体に耐熱性に優れた炭化珪素質のハニカム構造体を使用するケースが増えつつある。一般に、炭化珪素質ハニカム構造体は、炭化珪素粉末に必要な応じて金属珪素粉末を加え、水やバインダーとともに混練し、得られた混練土をハニカム形状に押出成形し、それを乾燥、焼成することで製造されるが、炭化珪素粉末や金属珪素粉末は水分を含むと凝集しやすいため、ボイドや粗大粒子などの構造欠陥が発生し、強度や熱伝導率が低下しやすいという問題がある。

[0009] そこで、炭化珪素質ハニカム構造体の製造においても、コーディエライト質ハニカム構造体の製造に用いられる前記従来技術のように、既に一度混練が行われている再生原料を出発原料の一部として使用することができれば、炭化珪素粉末や金属珪素粉末の分散性が向上し、前記のような構造欠陥の発生を緩和できる可能性がある。

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CLAIMS

[Claim(s)]

[Claim 1]

the boundary air-supply equipment of the boiler furnace characterized by to consider as the configuration which makes the boundary air which forms a clearance between the furnace insides of furnace wall tubing which bends some furnace wall tubing which constitutes the furnace wall of a boiler furnace so that it may project in the furnace inside partially, and adjoins the tooth-back side of the bending lobe of chip box music wooden-clogs each of this furnace wall tubing, and draws from the tooth-back side of the above-mentioned bending lobe blow off to the side through the above-mentioned clearance.

[Claim 2]

Boundary air supply equipment of the boiler furnace according to claim 1 characterized by installing the above-mentioned clearance and a duct open for free passage in the furnace outside of the above-mentioned furnace wall.

[Claim 3]

Boundary air supply equipment of the boiler furnace according to claim 1 or 2 characterized by forming the above-mentioned bending lobe near the crosswise center section of the furnace wall.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]

This invention relates to the boundary air supply equipment of the boiler furnace for making corrosion thinning of the furnace wall inside in a boiler furnace prevent.

[0002]

[Description of the Prior Art]

There is a two-stage combustion method as one of the approaches which reduces the nitrogen-oxides (NOX) concentration in the combustion gas discharged from a fossil fuel **** boiler. while this maintains the mixing ratio of a fuel and air by the whole boiler more than a chemically correct mixture ratio -- combustion in a boiler furnace -- two steps -- dividing -- air -- too little part and a part with superfluous air are made, and the amount of generation of NOX is made low by air bias combustion, maintaining the whole combustion efficiency.

[0003]

As the outline of that example is shown in drawing 3 and drawing 4, the boiler which is performing this kind of two-stage combustion In the field which establishes a primary zone 2 in the lower location of the furnace 1 which extends in the vertical direction, establishes a secondary combustion chamber 3 in the upper part section again, respectively, and corresponds with the above-mentioned primary zone 2 with the furnace walls 4a and 4b of order The burner 5 for burning a fossil fuel by the combustion air temporarily [too little] is installed crosswise [right-and-left] at intervals of necessary vertical multistage (three steps of things are shown by a diagram) one, and it has been made to carry out the low excess air ratio combustion of the fossil fuel in the primary zone 2 with this each burner 5.

[0004]

On the other hand in the above-mentioned secondary combustion chamber 3, in the necessary spacing location of the right-and-left cross direction in the furnace walls 4a and 4b before and behind a furnace 1 Exaggerated airport (it is hereafter referred to as OAP.) 6 -- respectively -- preparing -- this every -- the perfect combustion of the unburnt matter after the above-mentioned primary combustion is planned from OAP6 by [which is the need] supplying the air 7 for the secondary combustion of an amount enough to combustion of the unburnt matter which remains after primary combustion of the fossil fuel in the above-mentioned primary zone 2.

[0005]

The furnace walls 4a and 4b before and behind the above-mentioned furnace 1 and flank furnace wall 4of right and left c By making into basic structure the furnace wall panel which connects superficially much furnace wall tubing (water pipe) 8 with a fin 9, and becomes, and circulating boiler water according to the boiler-water-circulation device which is not illustrated in each above-mentioned furnace wall tubing 8, as all show drawing 4 It enables it to have cooled each furnace walls 4a, 4b, and 4c at the same time it aims at recovery of the heat of combustion of a fossil fuel. Then, it is made to make steamy overheating have presented with the hot combustion gas 10 discharged from the above-mentioned

secondary combustion chamber 3 by leading to the heat exchanger 11 for steamy generating prepared in the crowning side of this secondary combustion chamber 3, and carrying out heat exchange of the heat to hold to a boiler steam. In addition, 12 is the posterior part heat transfer section prepared in the downstream of the above-mentioned heat exchanger 11, and is considered as the configuration equipped with the various heat-absorptive machines 13, such as a superheater, a reheater, an air preheater, and a fuel economizer, if needed.

[0006]

As described above, by the way, in the primary zone 2 of the boiler furnace 1 Since it has been made to carry out the low excess air ratio combustion of the fossil fuel, the interior of this primary zone 2 serves as a reducing atmosphere. For this reason, there is a possibility that hydrogen-sulfide gas (H_2S) may occur from the sulfur content contained in the fuel, and we are anxious about a possibility that the hydrogen-sulfide gas which occurred in this case may corrode and thin down the inside of furnace walls 4a, 4b, and 4c.

[0007]

As one of the cures for preventing the corrosion of the furnace walls 4a, 4b, and 4c by such hydrogen-sulfide gas In the above-mentioned primary zone 2 and the corresponding lower part of a field, in the corner section of each longitudinal-direction both ends of the furnace walls 4a and 4b of order Install the Wall airport 14 towards a cross direction, and the Wall airport 15 turned to the corner section of the both ends of the cross direction of flank furnace wall 4c on either side at the longitudinal direction is installed further. The boundary air 16 is made to blow off from each Wall airport 14 established in the furnace walls 4a and 4b before and behind the above in accordance with the inside of flank furnace wall 4c on either side. Furthermore, there is a thing it was made to make the boundary air 16 blow off from each Wall airport established in flank furnace wall 4c of the above-mentioned right and left in accordance with the inside of the furnace walls 4a and 4b of order. It is made to make the air film form in the inside close-attendants side of each furnace walls 4a, 4b, and 4c of front and rear, right and left in a primary zone 2 along with a wall surface by the entrainment of this boundary air 16. It is made to make it prevent that near the inside of each above-mentioned furnace walls 4a, 4b, and 4c serves as a reducing atmosphere. By existence of this air film Even if hydrogen-sulfide gas occurs in the primary zone 1 used as the above-mentioned reducing atmosphere, the thing which enables it to prevent that this hydrogen-sulfide gas contacts furnace walls 4a and 4b and 4c inside is proposed (for example, patent reference 1 reference).

[0008]

moreover, as technique for preventing the incomplete combustion in near a furnace wall panel in the field to which the low excess air ratio combustion of the boiler furnace which has adopted the two-stage burning system is made to perform In the above-mentioned low-excess-air-ratio-combustion field in the furnace wall before and behind a furnace, and the corresponding corner section of the both ends of the longitudinal direction of a necessary height location By preparing the airport towards a cross direction, respectively, making the inside of the furnace wall of right and left of a furnace body meet, and making air blow off from this each airport The conventional proposal also of making it make an air space form near the inside of the furnace wall of these right and left, making the ambient atmosphere in near the inside of the furnace wall of these right and left into an oxidizing atmosphere, and also making it promote combustion by existence of this air space is made (for example, patent reference 2 reference).

[0009]

[Patent reference 1]

JP,11-237003,A

[Patent reference 2]

JP,2001-108229,A

[0010]

[Problem(s) to be Solved by the Invention]

However, since the overall depth of a furnace 1 is comparatively small by the boiler of a minor mold, The boundary air 16 made to blow off from the Wall airport 14 established in the necessary part

corresponding to the corner section of the furnace 1 in the furnace walls 4a and 4b of order as shown in the above-mentioned patent reference 1, the inside side of furnace wall 4c of these right and left in the field to which a low excess air ratio combustion is made to perform since the air made to blow off from the airport shown in the patent reference 2 arrives to the center section of flank furnace wall 4c on either side -- the whole surface -- continuing -- the film (layer) of air -- a wrap, although things are made By the large-sized boiler with the long depth dimension of a furnace, the air made to blow off from the Wall airport 14 shown in the patent reference 1 prepared in the furnace walls 4a and 4b of order or the airport shown in the patent reference 2 does not reach the center section of flank furnace wall 4c on either side. Therefore, even if it was the center section of the flank furnace wall of a furnace, to enable it to make the air film form in the inside side was desired.

[0011]

Then, even if this invention is the crosswise center section of the furnace wall in the furnace of a large-sized boiler, it is made to meet the inside of a furnace wall, can supply boundary air efficiently, tends to make the air film form near the inside of the furnace wall of a low-excess-air-ratio-combustion field, and tends to offer the boundary air supply equipment of the boiler furnace for preventing beforehand the corrosion of the furnace wall inside by hydrogen-sulfide gas, and thinning.

[0012]

[Means for Solving the Problem]

in order to solve the above-mentioned technical problem, this invention forms a clearance between the furnace insides of furnace wall tubing which bends some furnace wall tubing which constitutes the furnace wall of a boiler furnace so that it may project in the furnace inside partially, and adjoins the tooth-back side of the bending lobe of chip box music wooden-clogs each of this furnace wall tubing, and considers it as the configuration which makes the boundary air which draws from the tooth-back side of the above-mentioned bending lobe blow off to the side through the above-mentioned clearance.

[0013]

it can be made to blow off from the clearance formed between the furnace insides of furnace wall tubing contiguous to furnace wall tubing bent the tooth-back side of the above-mentioned bending lobe to the side so that boundary air may be made to meet inside [furnace] furnace wall tubing contiguous to the above-mentioned chip box music wooden-clogs furnace wall tubing thereby, inside [furnace] furnace wall tubing contiguous to the above-mentioned chip box music wooden-clogs furnace wall tubing, the air film with the boundary air which blows off from the above-mentioned clearance is formed. for this reason, since contacting furnace wall tubing with which this hydrogen-sulfide gas adjoins the above-mentioned chip box music wooden-clogs furnace wall tubing is prevented even if the hydrogen-sulfide gas originating in the sulfur content by which the furnace inside serves as a reducing atmosphere and is contained in a fuel occurs, the corrosion of the furnace wall inside constituted with furnace wall tubing contiguous to this chip box music wooden-clogs furnace wall tubing and thinning are prevented beforehand.

[0014]

Moreover, boundary air can be easily led to the above-mentioned clearance through the above-mentioned duct by considering as the configuration which installed the above-mentioned clearance and the duct open for free passage in the furnace outside of the above-mentioned furnace wall.

[0015]

Furthermore, by considering as the configuration in which the above-mentioned bending lobe was formed near the crosswise center section of the furnace wall, even if it is a large-sized boiler, the air film can be made to be able to form in the inside side in the center section of the furnace wall simply and efficiently, and the corrosion of a furnace wall center section and thinning can be prevented effectively.

[0016]

[Embodiment of the Invention]

Hereafter, the gestalt of operation of this invention is explained with reference to a drawing.

[0017]

Drawing 1 (b) (b) is what shows one gestalt of operation of the boundary air supply equipment of the

boiler furnace of this invention. The inside of the furnace wall tubing 8 of a large number which are mutually connected with a fin 9 and constitute the furnace wall panel like what was shown in drawing 4 , It bends so that these each furnace wall tubing 8a may make a part of longitudinal direction of furnace wall tubing 8a of plurality (drawing 7) located in a furnace wall center section project to the inside of a furnace 1 with the condition of having been mutually connected with the fin 9. with this chip box music wooden-clogs each furnace wall tubing 8a Between the furnace wall tubing 8 of the shape of a straight pipe which adjoins this, the tooth-back side of the bending lobe 17 of furnace wall tubing 8a, So that the clearance 18 between the necessary magnitude for making between the furnace inside sides of the furnace wall tubing 8 of the shape of an adjoining straight pipe which has not been bent open for free passage may be made to form and the tooth-back side of the bending lobe 17 of each above-mentioned furnace wall tubing 8a may be covered further Attach a duct 19 in the furnace outside of a furnace wall panel, the above-mentioned clearance 18 is made to open this duct 19 for free passage, and the boundary air supply equipment I of the boiler furnace of this invention is constituted.

[0018]

When using the boundary air supply equipment I of the boiler furnace of this invention, bend two or more furnace wall tubing 8a located in the center section of the cross direction of flank furnace wall 4c of right and left of a primary zone 2 with the boiler furnace 1 considered as the same configuration, and it is made to make a clearance 18 form in both sides, and is made to connect with having been shown in drawing 3 at the air supply section which does not illustrate a duct 19, as shown in drawing 2 . in this condition, if the boundary air 16 is drawn from the air supply section through the above-mentioned duct 19 at the time of boiler operation, this air 16 will blow off from the clearance 18 currently formed so that the furnace inside side of the furnace wall tubing 8 of the shape of a straight pipe which adjoins this chip box music wooden-clogs furnace wall tubing 8a group the tooth-back side of the bending lobe 17 of the above-mentioned furnace wall tubing 8a may be opened for free passage towards the side. Thereby, inside [furnace] the furnace wall tubing 8 of the shape of a straight pipe which adjoins the above-mentioned bending lobe 17, the air film with the boundary air 16 which blows off the account of a top comes to be formed.

[0019]

In addition, what is necessary is making it just make the furnace inside front face of the above-mentioned bending lobe carry out coating of an oxidation-resistant refractory material or oxidation-resistant corrosion resistance material if needed inside [furnace] the bending lobe 17 of each above-mentioned furnace wall tubing 8a, since the air film with the boundary air 16 made to blow off from the boundary air supply equipment I of the boiler furnace of this invention cannot be made to form. In addition, in drawing 1 (b) (b) and drawing 2 , the same sign is given to the same thing as what was shown in drawing 3 and drawing 4 .

[0020]

Therefore, according to the boundary air supply equipment I of the boiler furnace of above-mentioned this invention, the inside of each of this furnace wall 4c can be made to be able to meet the center section of the cross direction of flank furnace wall 4c of right and left of the primary zone 2 in a large-sized boiler, the boundary air 16 can be supplied, and the air film can be made to form in the inside close-attendants side of each of this furnace wall 4c efficiently. For this reason, even if hydrogen-sulfide gas occurs in the primary zone 2 which carries out a low excess air ratio combustion, a possibility of contact to flank furnace wall 4c of right and left of this hydrogen-sulfide gas being prevented, and corroding and thinning down the inside side of flank furnace wall 4c of these right and left can be prevented beforehand.

[0021]

In addition, although this invention is not limited only to the gestalt of the above-mentioned implementation and drawing 2 showed it as what formed the boundary air supply equipment I of the boiler furnace of this invention only in the center section of the cross direction in flank furnace wall 4c on either side, you may make it prepare in two or more places of cross-direction necessary spacing in the above-mentioned flank furnace wall 4c according to the overall depth of a boiler furnace. Moreover, an

up-and-down number of stages bends one place of the longitudinal direction of furnace wall tubing 8a, two places, or three places or more, and you may make it prepare them according to the dimension of the vertical direction of a primary zone as one step, two steps, or three steps or more. Two or more furnace wall tubing in the central part of the furnace walls 4a and 4b before and behind the boiler furnace 1 is bent to the furnace inside, and you may make it make the air film with the boundary air 16 form along the furnace wall side of furnace walls 4a and 4b from the crosswise center section of the furnace walls 4a and 4b of order. Moreover, if the boundary air 16 drawn through the duct 19 by the side of the tooth back of the bending part of bent furnace wall tubing can be made to blow off to the side The number of furnace wall tubing 8a bent to the inside of a furnace 1 You may set up free. Moreover, this each furnace wall tubing 8a Between the furnace wall tubing 8 of the shape of a straight pipe which does not check the flow of boiler water which circulates the inside of furnace wall tubing 8a, and adjoins If the clearance 18 for making the boundary air 16 blow off can be formed in the side, a bending configuration, the straight die length of the ability of modification to be variously added within limits which do not deviate from that it may be decided that it will be arbitration and the other summaries of this invention, etc. are natural.

[0022]

[Effect of the Invention]

As stated above, according to the boundary air supply equipment of the boiler furnace of this invention, the outstanding effectiveness like a less or equal is demonstrated.

(1) Bend some furnace wall tubing which constitutes the furnace wall of a boiler furnace so that it may project in the furnace inside partially. the tooth-back side of the bending lobe of chip box music wooden-clogs each of this furnace wall tubing Since it has considered as the configuration which makes the boundary air which forms a clearance between the furnace insides of adjoining furnace wall tubing, and is drawn from the tooth-back side of the above-mentioned bending lobe blow off to the side through the above-mentioned clearance The air film with boundary air can be made to be able to form efficiently inside [furnace] furnace wall tubing contiguous to furnace wall tubing in which the bending lobe was made to form, and, for this reason, the corrosion of the furnace wall inside constituted with furnace wall tubing located near bent furnace wall tubing and thinning can be prevented beforehand.

(2) Moreover, boundary air can be easily led to the above-mentioned clearance through the above-mentioned duct by considering as the configuration which installed the above-mentioned clearance and the duct open for free passage in the furnace outside of the above-mentioned furnace wall.

(3) By considering as the configuration in which the above-mentioned bending lobe was formed near the crosswise center section of the furnace wall, the air film can be made to be able to form also in the inside side of the furnace wall center section of the large-sized boiler which the boundary air blown from the corner section does not reach simply and efficiently, and the corrosion of a furnace wall center section and thinning can be prevented.

[Brief Description of the Drawings]

[Drawing 1] One gestalt of operation of the boundary air supply equipment of the boiler furnace of this invention is shown, (b) is an outline perspective view and (b) is the direction view Fig. of A-A of (b).

[Drawing 2] It is the schematic diagram showing the condition in the case of installing the equipment of drawing 1 in a boiler furnace.

[Drawing 3] It is the cutting side elevation showing the outline of an example of the boiler used conventionally.

[Drawing 4] It is the outline perspective view showing the structure of the furnace wall of the boiler of drawing 3.

[Description of Notations]

4a, 4b Furnace wall

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TECHNICAL FIELD

[Field of the Invention]

This invention relates to the boundary air supply equipment of the boiler furnace for making corrosion thinning of the furnace wall inside in a boiler furnace prevent.

[0002]

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PRIOR ART

[Description of the Prior Art]

There is a two-stage combustion method as one of the approaches which reduces the nitrogen-oxides (NOX) concentration in the combustion gas discharged from a fossil fuel **** boiler. while this maintains the mixing ratio of a fuel and air by the whole boiler more than a chemically correct mixture ratio -- combustion in a boiler furnace -- two steps -- dividing -- air -- too little part and a part with superfluous air are made, and the amount of generation of NOX is made low by air bias combustion, maintaining the whole combustion efficiency.

[0003]

As the outline of that example is shown in drawing 3 and drawing 4, the boiler which is performing this kind of two-stage combustion In the field which establishes a primary zone 2 in the lower location of the furnace 1 which extends in the vertical direction, establishes a secondary combustion chamber 3 in the upper part section again, respectively, and corresponds with the above-mentioned primary zone 2 with the furnace walls 4a and 4b of order The burner 5 for burning a fossil fuel by the combustion air temporarily [too little] is installed crosswise [right-and-left] at intervals of necessary vertical multistage (three steps of things are shown by a diagram) one, and it has been made to carry out the low excess air ratio combustion of the fossil fuel in the primary zone 2 with this each burner 5.

[0004]

On the other hand in the above-mentioned secondary combustion chamber 3, in the necessary spacing location of the right-and-left cross direction in the furnace walls 4a and 4b before and behind a furnace 1 Exaggerated airport (it is hereafter referred to as OAP.) 6 -- respectively -- preparing -- this every -- the perfect combustion of the unburnt matter after the above-mentioned primary combustion is planned from OAP6 by [which is the need] supplying the air 7 for the secondary combustion of an amount enough to combustion of the unburnt matter which remains after primary combustion of the fossil fuel in the above-mentioned primary zone 2.

[0005]

The furnace walls 4a and 4b before and behind the above-mentioned furnace 1 and flank furnace wall 4of right and left c By making into basic structure the furnace wall panel which connects superficially much furnace wall tubing (water pipe) 8 with a fin 9, and becomes, and circulating boiler water according to the boiler-water-circulation device which is not illustrated in each above-mentioned furnace wall tubing 8, as all show drawing 4 It enables it to have cooled each furnace walls 4a, 4b, and 4c at the same time it aims at recovery of the heat of combustion of a fossil fuel. Then, it is made to make steamy overheating have presented with the hot combustion gas 10 discharged from the above-mentioned secondary combustion chamber 3 by leading to the heat exchanger 11 for steamy generating prepared in the crowning side of this secondary combustion chamber 3, and carrying out heat exchange of the heat to hold to a boiler steam. In addition, 12 is the posterior part heat transfer section prepared in the downstream of the above-mentioned heat exchanger 11, and is considered as the configuration equipped with the various heat-absorptive machines 13, such as a superheater, a reheater, an air preheater, and a fuel economizer, if needed.

[0006]

As described above, by the way, in the primary zone 2 of the boiler furnace 1 Since it has been made to carry out the low excess air ratio combustion of the fossil fuel, the interior of this primary zone 2 serves as a reducing atmosphere. For this reason, there is a possibility that hydrogen-sulfide gas (H_2S) may occur from the sulfur content contained in the fuel, and we are anxious about a possibility that the hydrogen-sulfide gas which occurred in this case may corrode and thin down the inside of furnace walls 4a, 4b, and 4c.

[0007]

As one of the cures for preventing the corrosion of the furnace walls 4a, 4b, and 4c by such hydrogen-sulfide gas In the above-mentioned primary zone 2 and the corresponding lower part of a field, in the corner section of each longitudinal-direction both ends of the furnace walls 4a and 4b of order Install the Wall airport 14 towards a cross direction, and the Wall airport 15 turned to the corner section of the both ends of the cross direction of flank furnace wall 4c on either side at the longitudinal direction is installed further. The boundary air 16 is made to blow off from each Wall airport 14 established in the furnace walls 4a and 4b before and behind the above in accordance with the inside of flank furnace wall 4c on either side. Furthermore, there is a thing it was made to make the boundary air 16 blow off from each Wall airport established in flank furnace wall 4c of the above-mentioned right and left in accordance with the inside of the furnace walls 4a and 4b of order. It is made to make the air film form in the inside close-attendants side of each furnace walls 4a, 4b, and 4c of front and rear, right and left in a primary zone 2 along with a wall surface by the entrainment of this boundary air 16. It is made to make it prevent that near the inside of each above-mentioned furnace walls 4a, 4b, and 4c serves as a reducing atmosphere. By existence of this air film Even if hydrogen-sulfide gas occurs in the primary zone 1 used as the above-mentioned reducing atmosphere, the thing which enables it to prevent that this hydrogen-sulfide gas contacts furnace walls 4a and 4b and 4c inside is proposed (for example, patent reference 1 reference).

[0008]

moreover, as technique for preventing the incomplete combustion in near a furnace wall panel in the field to which the low excess air ratio combustion of the boiler furnace which has adopted the two-stage burning system is made to perform In the above-mentioned low-excess-air-ratio-combustion field in the furnace wall before and behind a furnace, and the corresponding corner section of the both ends of the longitudinal direction of a necessary height location By preparing the airport towards a cross direction, respectively, making the inside of the furnace wall of right and left of a furnace body meet, and making air blow off from this each airport The conventional proposal also of making it make an air space form near the inside of the furnace wall of these right and left, making the ambient atmosphere in near the inside of the furnace wall of these right and left into an oxidizing atmosphere, and also making it promote combustion by existence of this air space is made (for example, patent reference 2 reference).

[0009]

[Patent reference 1]

JP,11-237003,A

[Patent reference 2]

JP,2001-108229,A

[0010]

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EFFECT OF THE INVENTION

[Effect of the Invention]

As stated above, according to the boundary air supply equipment of the boiler furnace of this invention, the outstanding effectiveness like a less or equal is demonstrated.

(1) Bend some furnace wall tubing which constitutes the furnace wall of a boiler furnace so that it may project in the furnace inside partially. the tooth-back side of the bending lobe of chip box music wooden-clogs each of this furnace wall tubing Since it has considered as the configuration which makes the boundary air which forms a clearance between the furnace insides of adjoining furnace wall tubing, and is drawn from the tooth-back side of the above-mentioned bending lobe blow off to the side through the above-mentioned clearance The air film with boundary air can be made to be able to form efficiently inside [furnace] furnace wall tubing contiguous to furnace wall tubing in which the bending lobe was made to form, and, for this reason, the corrosion of the furnace wall inside constituted with furnace wall tubing located near bent furnace wall tubing and thinning can be prevented beforehand.

(2) Moreover, boundary air can be easily led to the above-mentioned clearance through the above-mentioned duct by considering as the configuration which installed the above-mentioned clearance and the duct open for free passage in the furnace outside of the above-mentioned furnace wall.

(3) By considering as the configuration in which the above-mentioned bending lobe was formed near the crosswise center section of the furnace wall, the air film can be made to be able to form also in the inside side of the furnace wall center section of the large-sized boiler which the boundary air blown from the corner section does not reach simply and efficiently, and the corrosion of a furnace wall center section and thinning can be prevented.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]

However, since the overall depth of a furnace 1 is comparatively small by the boiler of a minor mold, The boundary air 16 made to blow off from the Wall airport 14 established in the necessary part corresponding to the corner section of the furnace 1 in the furnace walls 4a and 4b of order as shown in the above-mentioned patent reference 1, the inside side of furnace wall 4c of these right and left in the field to which a low excess air ratio combustion is made to perform since the air made to blow off from the airport shown in the patent reference 2 arrives to the center section of flank furnace wall 4c on either side -- the whole surface -- continuing -- the film (layer) of air -- a wrap, although things are made By the large-sized boiler with the long depth dimension of a furnace, the air made to blow off from the Wall airport 14 shown in the patent reference 1 prepared in the furnace walls 4a and 4b of order or the airport shown in the patent reference 2 does not reach the center section of flank furnace wall 4c on either side. Therefore, even if it was the center section of the flank furnace wall of a furnace, to enable it to make the air film form in the inside side was desired.

[0011]

Then, even if this invention is the crosswise center section of the furnace wall in the furnace of a large-sized boiler, it is made to meet the inside of a furnace wall, can supply boundary air efficiently, tends to make the air film form near the inside of the furnace wall of a low-excess-air-ratio-combustion field, and tends to offer the boundary air supply equipment of the boiler furnace for preventing beforehand the corrosion of the furnace wall inside by hydrogen-sulfide gas, and thinning.

[0012]

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MEANS

[Means for Solving the Problem]

in order to solve the above-mentioned technical problem, this invention forms a clearance between the furnace insides of furnace wall tubing which bends some furnace wall tubing which constitutes the furnace wall of a boiler furnace so that it may project in the furnace inside partially, and adjoins the tooth-back side of the bending lobe of chip box music wooden-clogs each of this furnace wall tubing, and considers it as the configuration which makes the boundary air which draws from the tooth-back side of the above-mentioned bending lobe blow off to the side through the above-mentioned clearance.

[0013]

it can be made to blow off from the clearance formed between the furnace insides of furnace wall tubing contiguous to furnace wall tubing bent the tooth-back side of the above-mentioned bending lobe to the side so that boundary air may be made to meet inside [furnace] furnace-wall tubing contiguous to the above-mentioned chip box music wooden-clogs furnace wall tubing thereby, inside [furnace] furnace wall tubing contiguous to the above-mentioned chip box music wooden-clogs furnace wall tubing, the air film with the boundary air which blows off from the above-mentioned clearance is formed. for this reason, since contacting furnace wall tubing with which this hydrogen-sulfide gas adjoins the above-mentioned chip box music wooden-clogs furnace wall tubing is prevented even if the hydrogen-sulfide gas originating in the sulfur content by which the furnace inside serves as a reducing atmosphere and is contained in a fuel occurs, the corrosion of the furnace wall inside constituted with furnace wall tubing contiguous to this chip box music wooden-clogs furnace wall tubing and thinning are prevented beforehand.

[0014]

Moreover, boundary air can be easily led to the above-mentioned clearance through the above-mentioned duct by considering as the configuration which installed the above-mentioned clearance and the duct open for free passage in the furnace outside of the above-mentioned furnace wall.

[0015]

Furthermore, by considering as the configuration in which the above-mentioned bending lobe was formed near the crosswise center section of the furnace wall, even if it is a large-sized boiler, the air film can be made to be able to form in the inside side in the center section of the furnace wall simply and efficiently, and the corrosion of a furnace wall center section and thinning can be prevented effectively.

[0016]

[Embodiment of the Invention]

Hereafter, the gestalt of operation of this invention is explained with reference to a drawing.

[0017]

Drawing 1 (b) (b) is what shows one gestalt of operation of the boundary air supply equipment of the boiler furnace of this invention. The inside of the furnace wall tubing 8 of a large number which are mutually connected with a fin 9 and constitute the furnace wall panel like what was shown in drawing 4 , It bends so that these each furnace wall tubing 8a may make a part of longitudinal direction of furnace wall tubing 8a of plurality (drawing 7) located in a furnace wall center section project to the

inside of a furnace 1 with the condition of having been mutually connected with the fin 9. with this chip box music wooden-clogs each furnace wall tubing 8a Between the furnace wall tubing 8 of the shape of a straight pipe which adjoins this, the tooth-back side of the bending lobe 17 of furnace wall tubing 8a, So that the clearance 18 between the necessary magnitude for making between the furnace inside sides of the furnace wall tubing 8 of the shape of an adjoining straight pipe which has not been bent open for free passage may be made to form and the tooth-back side of the bending lobe 17 of each above-mentioned furnace wall tubing 8a may be covered further Attach a duct 19 in the furnace outside of a furnace wall panel, the above-mentioned clearance 18 is made to open this duct 19 for free passage, and the boundary air supply equipment I of the boiler furnace of this invention is constituted.

[0018]

When using the boundary air supply equipment I of the boiler furnace of this invention, bend two or more furnace wall tubing 8a located in the center section of the cross direction of flank furnace wall 4c of right and left of a primary zone 2 with the boiler furnace 1 considered as the same configuration, and it is made to make a clearance 18 form in both sides, and is made to connect with having been shown in drawing 3 at the air supply section which does not illustrate a duct 19, as shown in drawing 2 . in this condition, if the boundary air 16 is drawn from the air supply section through the above-mentioned duct 19 at the time of boiler operation, this air 16 will blow off from the clearance 18 currently formed so that the furnace inside side of the furnace wall tubing 8 of the shape of a straight pipe which adjoins this chip box music wooden-clogs furnace wall tubing 8a group the tooth-back side of the bending lobe 17 of the above-mentioned furnace wall tubing 8a may be opened for free passage towards the side. Thereby, inside [furnace] the furnace wall tubing 8 of the shape of a straight pipe which adjoins the above-mentioned bending lobe 17, the air film with the boundary air 16 which blows off the account of a top comes to be formed.

[0019]

In addition, what is necessary is making it just make the furnace inside front face of the above-mentioned bending lobe carry out coating of an oxidation-resistant refractory material or oxidation-resistant corrosion resistance material if needed inside [furnace] the bending lobe 17 of each above-mentioned furnace wall tubing 8a, since the air film with the boundary air 16 made to blow off from the boundary air supply equipment I of the boiler furnace of this invention cannot be made to form. In addition, in drawing 1 (b) (b) and drawing 2 , the same sign is given to the same thing as what was shown in drawing 3 and drawing 4 .

[0020]

Therefore, according to the boundary air supply equipment I of the boiler furnace of above-mentioned this invention, the inside of each of this furnace wall 4c can be made to be able to meet the center section of the cross direction of flank furnace wall 4c of right and left of the primary zone 2 in a large-sized boiler, the boundary air 16 can be supplied, and the air film can be made to form in the inside close-attendants side of each of this furnace wall 4c efficiently. For this reason, even if hydrogen-sulfide gas occurs in the primary zone 2 which carries out a low excess air ratio combustion, a possibility of contact to flank furnace wall 4c of right and left of this hydrogen-sulfide gas being prevented, and corroding and thinning down the inside side of flank furnace wall 4c of these right and left can be prevented beforehand.

[0021]

In addition, although this invention is not limited only to the gestalt of the above-mentioned implementation and drawing 2 showed it as what formed the boundary air supply equipment I of the boiler furnace of this invention only in the center section of the cross direction in flank furnace wall 4c on either side, you may make it prepare in two or more places of cross-direction necessary spacing in the above-mentioned flank furnace wall 4c according to the overall depth of a boiler furnace. Moreover, an up-and-down number of stages bends one place of the longitudinal direction of furnace wall tubing 8a, two places, or three places or more, and you may make it prepare them according to the dimension of the vertical direction of a primary zone as one step, two steps, or three steps or more. Two or more furnace wall tubing in the central part of the furnace walls 4a and 4b before and behind the boiler

furnace 1 is bent to the furnace inside, and you may make it make the air film with the boundary air 16 form along the furnace wall side of furnace walls 4a and 4b from the crosswise center section of the furnace walls 4a and 4b of order. Moreover, if the boundary air 16 drawn through the duct 19 by the side of the tooth back of the bending part of bent furnace wall tubing can be made to blow off to the side The number of furnace wall tubing 8a bent to the inside of a furnace 1 You may set up free. Moreover, this each furnace wall tubing 8a Between the furnace wall tubing 8 of the shape of a straight pipe which does not check the flow of boiler water which circulates the inside of furnace wall tubing 8a, and adjoins If the clearance 18 for making the boundary air 16 blow off can be formed in the side, a bending configuration, the straight die length of the ability of modification to be variously added within limits which do not deviate from that it may be decided that it will be arbitration and the other summaries of this invention, etc. are natural.

[0022]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] One gestalt of operation of the boundary air supply equipment of the boiler furnace of this invention is shown, (b) is an outline perspective view and (b) is the direction view Fig. of A-A of (b).

[Drawing 2] It is the schematic diagram showing the condition in the case of installing the equipment of drawing 1 in a boiler furnace.

[Drawing 3] It is the cutting side elevation showing the outline of an example of the boiler used conventionally.

[Drawing 4] It is the outline perspective view showing the structure of the furnace wall of the boiler of drawing 3.

[Description of Notations]

4a, 4b Furnace wall

4c Flank furnace wall (furnace wall)

8 8a Furnace wall tubing

16 Boundary Air

17 Bending Lobe

18 Clearance

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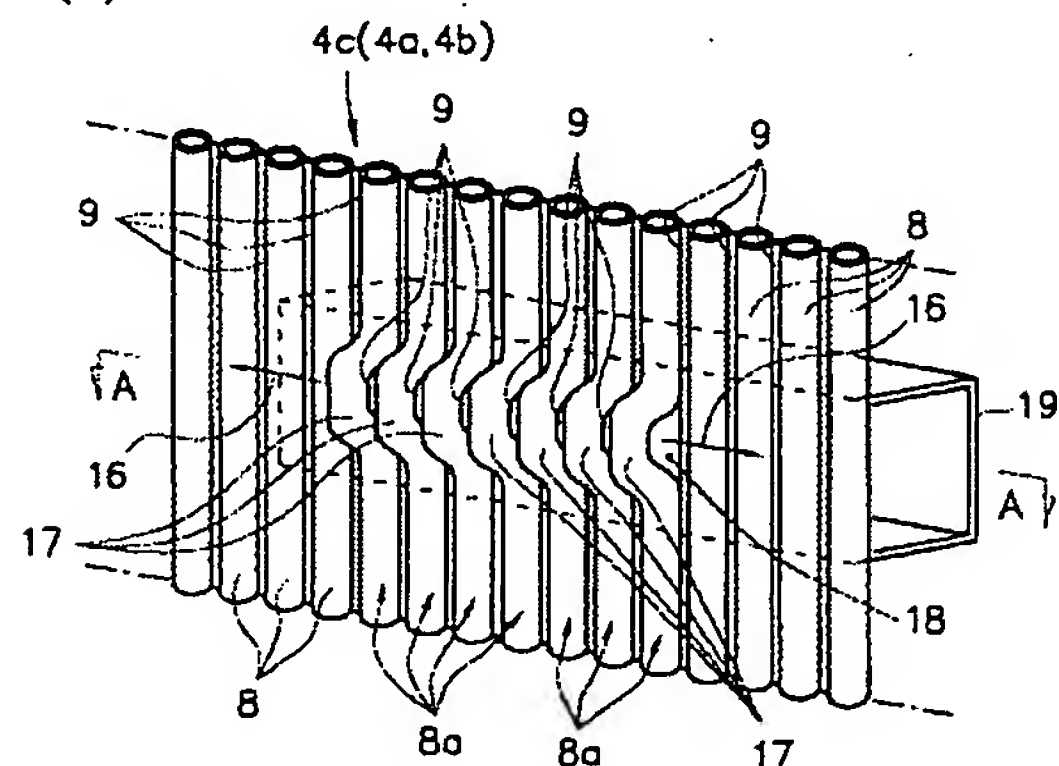
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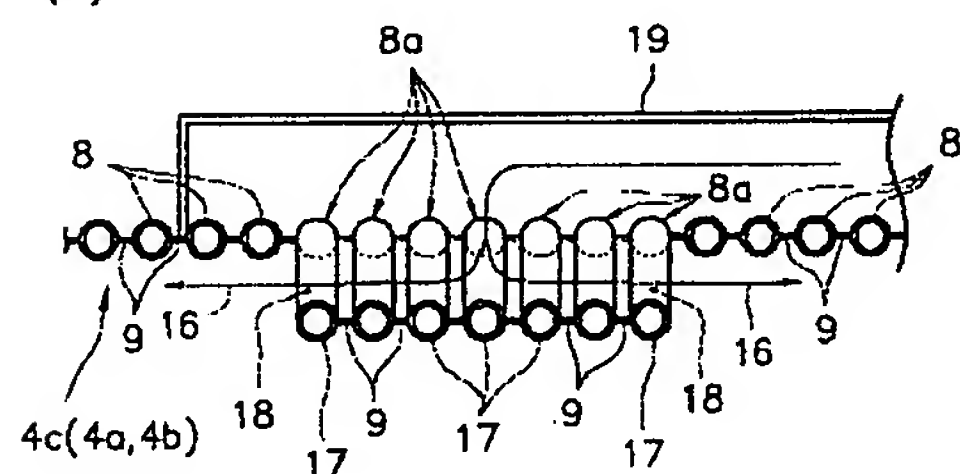
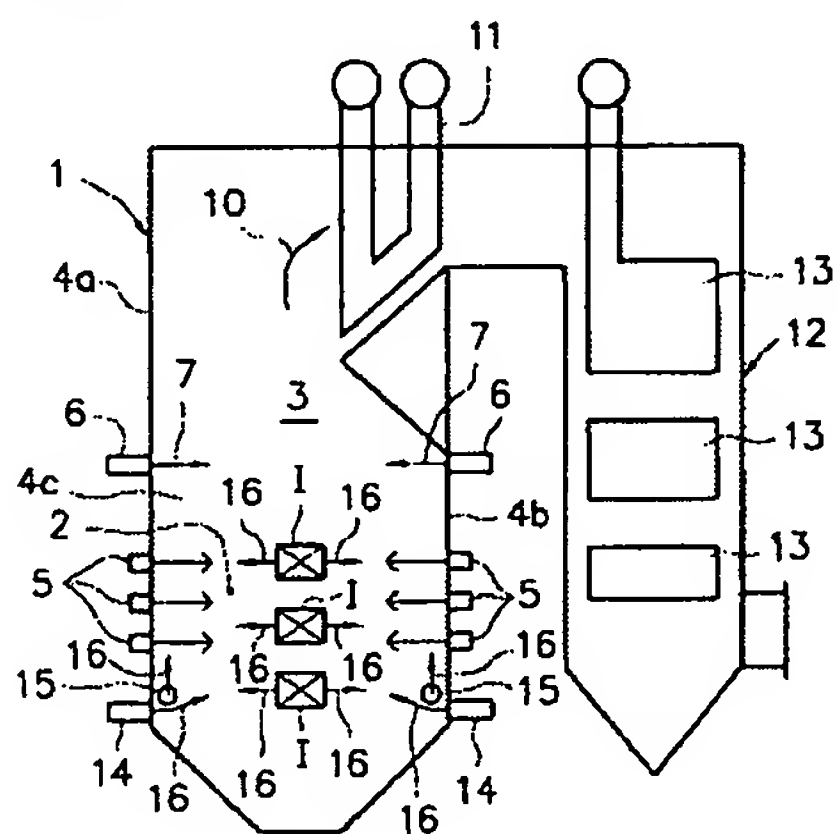
DRAWINGS

[Drawing 1]

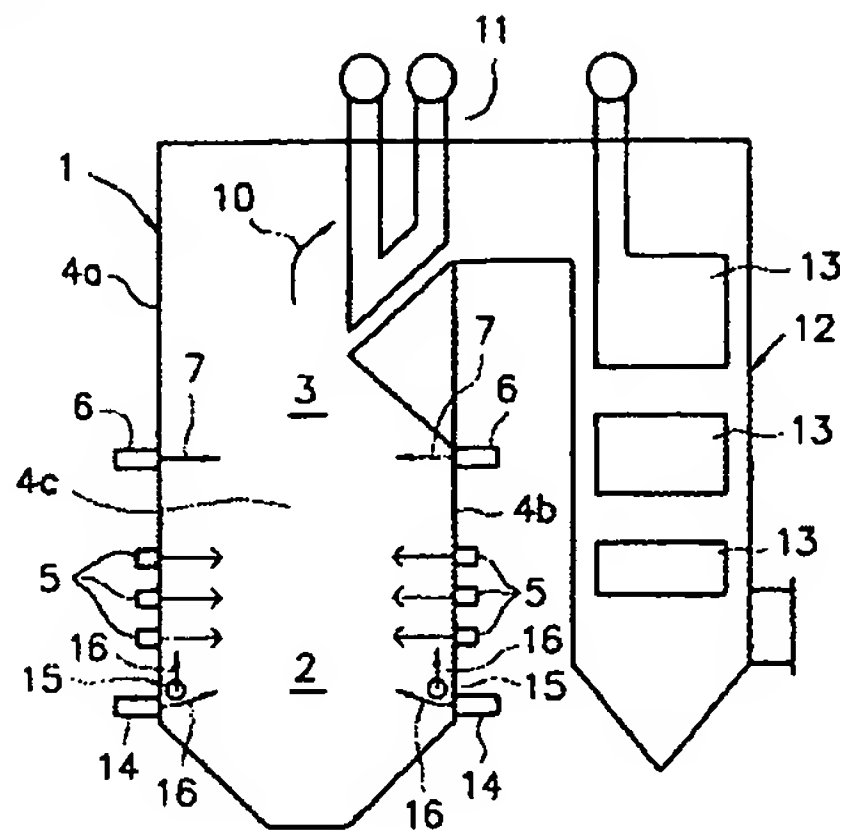
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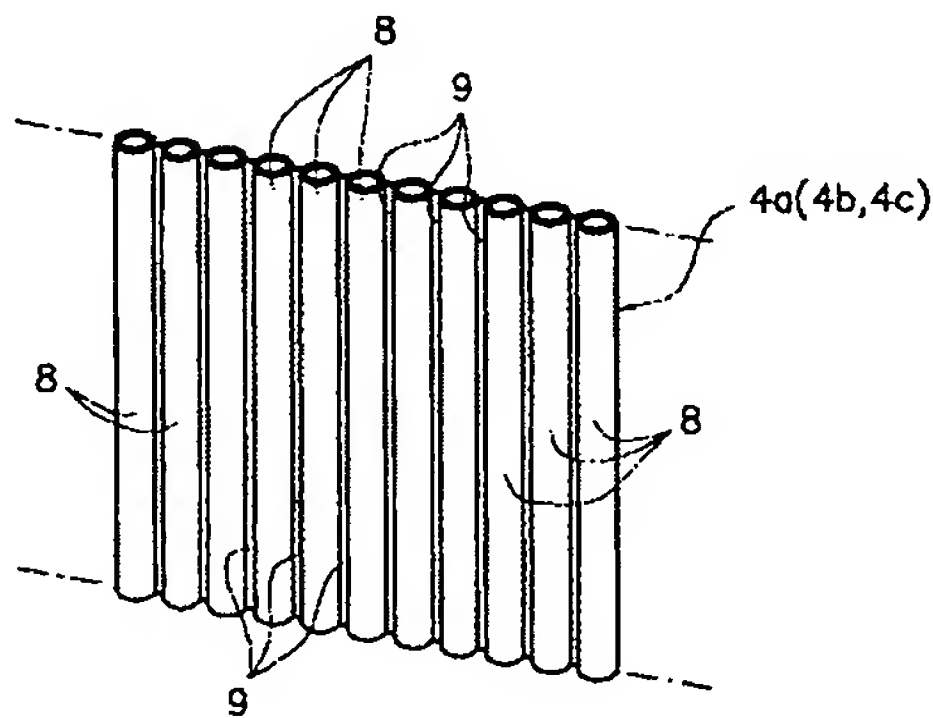
(a)

[Drawing 2]

[Drawing 3]



[Drawing 4]



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